

The Moderating Role of Agricultural Product Categories in the Relationship Between Digital Marketing Competencies and Marketing Performance

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Digital transformation has become a critical driver of competitiveness in various industries including agriculture. With challenges such as limited market access and low competitiveness of agricultural products, digital marketing competencies have emerged as essential for improving business performance. This study examines the impact of Digital Marketing Competencies on Marketing Performance and Continuance Intention. It focuses on the mediating role of Marketing Performance and the moderating influence of Agricultural Product Categories. This study involved 279 Micro, Small, and Medium Enterprises (MSMEs) spread across six provinces on the island of Sulawesi: Central Sulawesi, South Sulawesi, Southeast Sulawesi, North Sulawesi, Gorontalo, and West Sulawesi. Data was collected through online questionnaires distributed via e-commerce platforms and analyzed using Jamovi software. The study explored direct, mediated, and moderated relationships across three agricultural product categories, Fresh, Processed, and Support Products. Additional analysis using One-Way ANOVA was carried out to evaluate differences in moderating effects based on product categories. The findings reveal that Digital Marketing Competencies positively influence both Marketing Performance and Continuance Intention. This relationship is strengthened through the mediating role of Marketing Performance, demonstrating its importance in translating digital marketing efforts into sustainable outcomes. Agricultural Product Categories were found to moderate the effectiveness of digital marketing, with Support Products such as fertilizers and farming tools showing the highest marketing performance. This reflects their strong market appeal compared to Fresh Products, which face greater challenges, and Processed Products, which have fallen with no significant differences compared to the other categories. These results highlight the importance of tailoring digital marketing strategies to specific product types. To remain competitive, agricultural business operators need to adopt innovative marketing approaches, particularly for Fresh and Processed Products, while leveraging the inherent strengths of Support Products. By optimizing digital marketing competencies, businesses can achieve improved performance and sustainable growth in the agricultural sector.

Keywords: Agriculture entrepreneurs, digital transformation, e-commerce platform, marketing competitiveness, digital marketing, continuance intention .

INTRODUCTION

Digital transformation has created significant changes across various economic sectors, including agriculture (Rijswijk *et al.*, 2021). As one of the main pillars of the economy, the agricultural sector faces major challenges in adapting to digital technology in marketing activities. Digital marketing competencies, which include the ability to utilize social media, e-commerce platforms, and analytical tools, play an important role in supporting marketing efficiency and effectiveness. By using these technologies, agricultural entrepreneurs can enhance product visibility, expand market

access, and increase consumer engagement (Zia and Alzahrani, 2022).

In addressing the challenges of competitiveness and limited market access in the agricultural sector, digital marketing competencies have become a crucial element for agricultural MSMEs in improving their business performance (Phiri, 2020). The Technology Acceptance Model (TAM) provides a theoretical framework to explain how users' perceptions of digital technology influence its adoption and utilization (Davis *et al.*, 1989; Sharma *et al.*, 2024). TAM emphasizes that perceived usefulness (PU) and perceived ease of use (PEU) play significant roles in shaping users' attitudes and

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intentions to adopt technology (Venkatesh *et al.*, 2003). PU reflects the extent to which users believe that digital technology can deliver tangible benefits in enhancing marketing performance, while PEU refers to the ease with which the technology can be used in daily activities. In the context of digital marketing, integrating TAM allows for a better understanding of how users' perceptions of usefulness and ease of use influence the effectiveness of digital marketing strategies. Thus, TAM can be utilized to develop marketing strategies tailored to user characteristics and the types of products being marketed, thereby increasing the success of technology adoption and improving business performance in the agricultural sector.

The categories of agricultural products, consisting of Fresh Agricultural (fresh products such as fruits and vegetables), Processed Agricultural (processed products like cocoa and coffee), and Agricultural Support (supporting products such as fertilizers and farming tools), have unique characteristics (Farnworth and Goodman, 2008; Kolavalli, 2019). These characteristics determine how digital marketing strategies should be tailored to achieve optimal results. Previous studies have shown that fresh products require marketing strategies that emphasize speed and trust, while processed and supporting agricultural products tend to focus more on added value and innovation (Zhang, 2024). With the increasing adoption of digital technology in the agricultural sector, it is important to understand how digital marketing competencies affect marketing performance and the continuance intention of farmers to keep using digital strategies (Hermawati *et al.*, 2021). This research is expected to make a valuable contribution to the development of marketing strategies suited to the needs of the agricultural sector in Indonesia.

Digital marketing competencies include the technical and strategic skills possessed by farmers or agricultural business actors in utilizing digital technology for marketing purposes. Mihailović *et al.* (2024) explains that skills such as social media optimization, e-commerce platform management, and customer data analysis are crucial for creating stronger relationships between farmers and consumers. In the agricultural sector, these competencies help improve product visibility, expand market access, and foster customer loyalty. Marketing performance refers to the effectiveness and efficiency of marketing strategies in achieving business goals. Li *et al.* (2020) found that agricultural companies that consistently adopt digital strategies experience improvements in performance indicators such as sales volume, customer loyalty, and market satisfaction. In this context, marketing performance is also a key indicator that connects digital marketing competencies with the sustainable use of digital strategies.

Continuance intention reflects farmers' willingness to continue using digital marketing strategies in the long term. Research by Su *et al.* (2021) highlights that trust in digital technology and perceived direct benefits are the primary

drivers of continuance intention. When farmers observe how digital marketing competencies improve their marketing performance, they are more motivated to keep leveraging these technologies.

Agricultural Product Categories have unique characteristics based on their types. Fresh Agricultural focuses on freshness and fast delivery; Processed Agricultural emphasizes added value and processing; while Agricultural Support requires approaches that highlight functionality and efficiency. Zhang (2024) underscore that digital marketing strategies tailored to specific categories are more effective in improving marketing performance than generic approaches. Although the literature has addressed the importance of digitalization in agricultural marketing, several research gaps remain. First, most studies only examine the relationship between Digital Marketing Competencies and Marketing Performance in general, without exploring their impact on continuance intention, particularly in the agricultural sector in Indonesia. Research specifically integrating marketing performance as a mediating variable is also very limited (Sher *et al.*, 2019; Li *et al.*, 2020). Second, while agricultural product categories significantly influence the effectiveness of digital marketing, the role of product categories such as Fresh Agricultural, Processed Agricultural, and Agricultural Support as moderators in the relationship between Digital Marketing Competencies and Marketing Performance has not been extensively studied. Zhang (2024) and Hui *et al.* (2022) suggest that product categories can alter the dynamics of this relationship. However, empirical analyses using One-Way ANOVA to explore these differences are still rare. Therefore, this study aims to fill these gaps and provide a more comprehensive understanding.

Sulawesi is a prime location for agricultural product sales due to its rich natural resources, diverse agricultural output, and strategic position as a key trade hub in Indonesia. Comprising six provinces Central Sulawesi, South Sulawesi, Southeast Sulawesi, North Sulawesi, Gorontalo, and West Sulawesi the island boasts fertile land, favourable climatic conditions, and a strong agricultural tradition. The region produces a wide range of commodities categorized into Fresh Agricultural Products (such as fruits and vegetables), Processed Agricultural Products (including cocoa and coffee), and Agricultural Support Products (such as fertilizers and farming tools), each with distinct market potential. With increasing digitalization and expanding market access, Sulawesi offers significant opportunities for agricultural businesses to enhance their sales and competitiveness through optimized digital marketing strategies.

These regions hold great potential for utilizing digital technology to support agricultural product marketing. Key products such as cocoa, coconut, and various processed goods are the economic mainstays of the area. However, the adoption of digital technology among farmers and agricultural



business operators still faces challenges, including low digital literacy, limited infrastructure, and a lack of training.

Agricultural Product Categories and Their Marketing Needs. The agricultural product categories in this region include Fresh Agricultural (e.g., fresh fruits and vegetables), Processed Agricultural (e.g., processed cocoa products), and Agricultural Support (e.g., fertilizers and farming tools) (Temu and Temu, 2005). Each of these categories requires distinct digital marketing approaches to achieve optimal results. Thus, this study aims to understand how Digital Marketing Competencies can enhance Marketing Performance and Continuance Intention and how product categories moderate these relationships.

This research explores key relationships. First, it examines how Digital Marketing Competencies Influence Marketing Performance and Continuance Intention, given the critical role of digital marketing skills in boosting marketing performance while encouraging consumers' sustained engagement. Second, the study investigates the mediating role of Marketing Performance in the relationship between Digital Marketing Competencies and Continuance Intention, aiming to understand the extent to which marketing performance serves as a significant intermediary. Furthermore, the study highlights the moderating role of Agricultural Product Categories in the relationship between Digital Marketing Competencies and Marketing Performance. Categories such as Fresh Agricultural, Processed Agricultural, and Agricultural Support are analyzed to determine whether product types strengthen or weaken the impact of digital marketing on performance and whether significant differences exist in Marketing Performance based on product categories. This analysis provides valuable insights into how marketing strategies can be tailored to specific product characteristics.

MATERIALS AND METHODS

This study employs a quantitative approach with an explanatory design to examine the relationships between Digital Marketing Competencies, Marketing Performance, Continuance Intention, and the moderating role of Agricultural Product Categories. This research focuses on Micro, Small, and Medium Enterprises (MSMEs) in the agricultural sector that market their products through e-commerce platforms. Respondents were selected using purposive sampling, ensuring that participants were actively using digital platforms for their marketing activities. The sampling technique used in this study was purposive sampling, with a total of 279 MSMEs from Sulawesi Island selected as the sample, covering six provinces: Central Sulawesi, South Sulawesi, Southeast Sulawesi, North Sulawesi, Gorontalo, and West Sulawesi. Purposive sampling was chosen to ensure that the selected sample reflects regional

diversity and relevant business characteristics in the agricultural sector.

Digital marketing competencies and marketing performance were each measured using three statement items adopted from Sharabati *et al.* (2023), while continuance intention was measured using two items from Chen *et al.* (2012). Processed Agricultural was coded as 1, Agricultural Support as 2, and Fresh Agricultural as 3. This coding was used as a categorical variable to classify agricultural product types in the analysis, enabling systematic comparisons in evaluating digital marketing and the business performance of agricultural MSMEs.

These regions were considered representative of the dynamics of digital marketing in the agricultural sector. Data was collected through online questionnaires distributed via e-commerce platforms and analyzed using Jamovi software. Data was collected through an online questionnaire survey and analyzed using Jamovi software, which enabled simultaneous testing of direct relationships, mediation effects, and moderation analysis for agricultural product categories (Fresh Agricultural, Processed Agricultural, and Agricultural Support). An additional analysis using One-Way ANOVA was conducted to identify differences in moderation effects based on product categories. The findings are expected to provide deeper insights into the role of digital marketing in improving marketing performance and continuance intention within the agricultural sector. The conceptual framework for this study is presented in Fig.1.

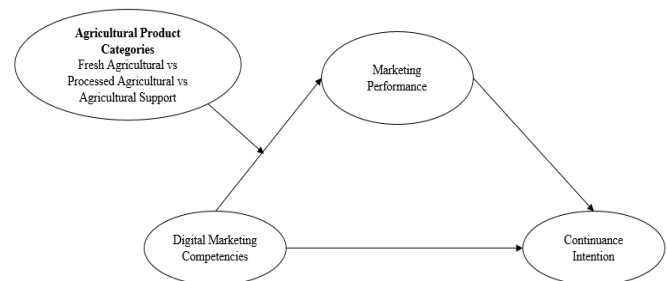


Figure 1. Conceptual framework.

RESULTS

Descriptive results of data analysis: The descriptive results (Table 1) of this data analysis provide an overview of the distribution of values for the variables studied: Agricultural Product Categories, Digital Marketing Competencies, and Marketing Performance. A total of 279 respondents were included for each variable, providing a strong foundation for further analysis. The mean values indicate that respondents generally have positive perceptions of these variables, with an average score of 4.43 for Agricultural Product Categories, 5.04 for Digital Marketing Competencies, and 4.24 for Marketing Performance. This suggests that while most respondents rate digital marketing competencies favourably,



Table 1. Descriptive statistics of variables.

	Agricultural Product Categories	Digital Marketing Competencies	Marketing Performance	Continuance Intention
N	279.000	279.000	279.000	279.000
Mean		4.430	5.040	4.240
Std. error mean		0.137	0.105	0.122
Median		6.000	5.000	4.000
Standard deviation		2.300	1.750	2.030
Minimum		1.000	1.000	1.000
Maximum		7.000	7.000	7.000

Table 2. Frequency of agricultural product categories.

Variable Category	Number of Respondents	Percentage (%)	Products
Processed Agricultural	202	72.40	Rice, ground coffee, cassava chips, palm sugar
Agricultural Support	7	2.51	Organic fertilizer, plant seeds, farming tools
Fresh Agricultural	70	25.09	Spinach, carrots, mangoes, chili peppers, ginger
Total	279	100.00	

their evaluations of agricultural product categories and marketing performance are slightly lower. The small standard error of the mean (0.137, 0.105, and 0.122, respectively) demonstrates that the sample mean is close to the population mean, indicating that the analysis is both accurate and reliable. The median values of 6, 5, and 4 for the respective variables show that most respondents provided ratings near or above the average. The recorded standard deviations 2.30 for Agricultural Product Categories, 1.75 for Digital Marketing Competencies, and 2.03 for Marketing Performance reflect a considerable variation in respondents' responses. This variation suggests diverse perspectives among the respondents regarding each variable. Additionally, the minimum and maximum values of 1 and 7 confirm that a 7-point Likert scale was used to collect data. This scale allowed respondents to express their level of agreement with greater precision.

The frequency table results for the Agricultural Product Categories variable show the distribution of respondents based on the identified product types: Most respondents (202 individuals or 72.40%) selected the Processed Agricultural category, which includes processed products such as rice, ground coffee, cassava chips, and palm sugar (Table 2). This indicates that processed agricultural products are the primary focus or preference for most respondents. The Fresh Agricultural category, comprising fresh products such as spinach, carrots, mangoes, chilli peppers, and ginger, was chosen by 70 respondents, representing 25.09% of the total. This reflects a considerable level of interest in fresh products, though not as prominent as processed products. Conversely, the Agricultural Support category, which includes items such as organic fertilizers, plant seeds, and farming tools, recorded only 7 respondents, or 2.51%. This suggests that agricultural

support products are not a significant priority among respondents in this study.

Table 3. Confirmatory Factor Analysis (CFA).

Factor	Indicator	Estimate	p	Cronbach's alpha
Digital	DMC1	2.26	0.001	0.995
Marketing	DMC2	2.24	0.001	
Competencies	DMC3	2.25	0.001	
Marketing	MP1	1.72	0.001	0.990
Performance	MP3	1.74	0.001	
	MP2	1.65	0.001	
Continuance	CI1	1.69	0.001	0.998
Intention	CI2	2.22	0.001	

The results of the Confirmatory Factor Analysis (CFA) indicate that all indicators have statistically significant loading factors ($p < 0.001$), with estimated values ranging from 1.65 to 2.26. The indicators for each factor show a very strong relationship with the latent factors they represent. For instance, regarding the Digital Marketing Competencies factor, indicators DMC1, DMC2, and DMC3 have estimates exceeding 2.2, demonstrating that these indicators consistently and validly represent the factor. Similarly, the Marketing Performance and Continuance Intention factors also exhibit very strong relationships with their respective indicators. With a very high Cronbach's Alpha (above 0.990 for all factors), the model demonstrates excellent internal reliability, ensuring that each indicator consistently measures the same dimension. These results reflect that the CFA model has achieved very high validity and reliability. The high loading factor values across all indicators highlight strong and significant relationships with the latent factors, while



Cronbach's Alpha values confirm that the measurement scale used is highly reliable.

Table 4. Model Fit.

Test for Exact Fit				
χ^2	df	p		
30.4	17	0.024		
Fit Measures				
CFI	TLI	RMSEA	RMSEA 90% CI	
			Lower	Upper
0.997	0.995	0.0531	0.0192	0.0832

The model fit evaluation results indicate that the CFA model has excellent fit. The CFI value (0.997) and TLI value (0.995), both close to 1, suggest a very good fit with the data. Although the Chi-Square value ($\chi^2 = 30.4$, $df = 17$, $p = 0.024$) indicates that the model is not a perfect fit ($p < 0.05$), this is expected due to the Chi-Square test's sensitivity to sample size. Additionally, the RMSEA value (0.0531) falls within an acceptable fit range, with a 90% confidence interval (0.0192–0.0832) approaching the category of excellent fit.

The effect of digital marketing competencies on marketing performance and continuance intention: Hypothesis testing was conducted to evaluate the direct effects between the key variables in this study (Table 5).

Digital Marketing Competencies have a positive and significant effect on Marketing Performance. The regression coefficient (b) of 4.50 indicates that every one-unit increase in Digital Marketing Competencies improves Marketing Performance by 4.50 units. The standard error (SE) of 0.19 reflects a low level of uncertainty in the coefficient estimate, ensuring accurate results. The p-value of 0.00 confirms that this relationship is statistically significant ($p < 0.05$), meaning the effect is not due to chance. The correlation coefficient (R) of 0.40 indicates a moderate relationship between Digital Marketing Competencies and Marketing Performance. Additionally, the R^2 value of 0.16 suggests that 16% of the variation in Marketing Performance is explained by Digital Marketing Competencies, while the remaining 84% is influenced by other factors outside the model.

Digital Marketing Competencies also have a positive and significant effect on Continuance Intention. The regression coefficient (b) of 3.97 shows that each one-unit increase in Digital Marketing Competencies leads to a 3.97-unit increase in Continuance Intention. The standard error (SE) of 0.24 indicates minimal uncertainty in the coefficient estimate, ensuring reliability. The p-value of 0.00 confirms the statistical significance of this effect ($p < 0.05$), meaning the effect is not random. However, the correlation coefficient (R) of 0.18 indicates a weak relationship between Digital Marketing Competencies and Continuance Intention. The R^2 value of 0.03 shows that only 3% of the variation in Continuance Intention is explained by Digital Marketing Competencies, while 97% is influenced by other factors not included in the model.

Marketing Performance has a positive and significant effect on Continuance Intention. The regression coefficient (b) of 33.57 indicates that every one unit increase in Marketing Performance Boosts Continuance Intention by 33.57 units. The standard error (SE) of 0.53 reflects a low level of uncertainty in the coefficient estimate, ensuring accuracy. The p-value of 0.00 confirms that this relationship is statistically significant ($p < 0.05$), meaning the effect is not due to chance. The correlation coefficient (R) of 0.25 indicates a weak to moderate relationship between Marketing Performance and Continuance Intention. Additionally, the R^2 value of 0.06 shows that only 6% of the variation in Continuance Intention is explained by Marketing Performance, while the remaining 94% is influenced by other factors outside the model.

The mediating role of marketing performance and the moderating role of agricultural product categories: This study highlights the critical role of Marketing Performance as a mediator and Agricultural Product Categories as a moderator in the relationship between Digital Marketing Competencies and Continuance Intention, as explained in Table 6.

The analysis results indicate that Marketing Performance serves as a mediating variable in the relationship between Digital Marketing Competencies and Continuance Intention. The indirect path has an estimate of 0.0624, a standard error (SE) of 0.0202, and a p-value of 0.002, which is statistically

Table 5. Hypothesis testing direct effects.

Variables	Model 1					Model 2				
	Marketing Performance					Continuance Intention				
	b	SE	p	R	R^2	b	SE	p	R	R^2
Digital Marketing Competencies	4.50	0.19	0.00	0.40	0.16	3.97	0.24	0.00	0.18	0.03
Marketing Performance	33.6	0.53	0.00	0.25	0.06					

Table 6. Path analysis indirect and moderation effects.

	Estimate	SE	p
Digital Marketing Competencies > Marketing Performance >	0.0624	0.0202	0.002
Digital Marketing Competencies * Agricultural Product Categories	0.3220	0.0955	0.001



significant ($p < 0.05$). This suggests that digital marketing competencies influence continuance intention not only directly but also through improved marketing performance. In other words, higher digital marketing competencies lead to better marketing performance, which ultimately drives continuance intention. Additionally, Agricultural Product Categories moderate the relationship between Digital Marketing Competencies and Marketing Performance. The results show an estimate of 0.322, an SE of 0.0955, and a p-value of < 0.001 , indicating high statistical significance. This demonstrates that the effect of digital marketing competencies on marketing performance varies depending on the agricultural product category, such as fresh products, processed products, or agricultural support products. These findings underscore the importance of tailoring digital marketing strategies to the specific product type to achieve optimal performance outcomes.

Differences in marketing performance based on agricultural product categories: This study explores differences in marketing performance based on agricultural product categories, namely Fresh Agricultural, Processed Agricultural, and Agricultural Support. The analysis aims to understand how the unique characteristics of each product category influence the success of digital marketing strategies implemented. These differences in marketing performance reflect the challenges and opportunities faced by businesses in marketing each type of product.

The One-Way ANOVA results (Table 7) show significant differences in Marketing Performance across Agricultural

Product Categories, with an F-value of 4.79, $df_1 = 2$, $df_2 = 17.1$, and $p = 0.022$ ($p < 0.05$). This indicates that at least one group has a significantly different mean Marketing Performance compared to the others. The Agricultural Support category recorded the highest mean Marketing Performance (mean = 6.29, SD = 1.11), followed by Processed Agricultural (mean = 5.08, SD = 1.74) and Fresh Agricultural (mean = 4.80, SD = 1.77). Thus, agricultural support products such as fertilizers and farming tools tend to achieve higher marketing performance compared to processed and fresh products. However, the larger standard error (SE) observed in smaller sample groups, such as Agricultural Support (SE = 0.421), suggests that the results for this category are less stable compared to the other groups. The results of the Games-Howell Post-Hoc Test indicate a significant difference in Marketing Performance between Fresh Agricultural and Agricultural Support products, with a mean difference of -1.49, t-value -3.15, df 9.39, and p-value 0.027 ($p < 0.05$), suggesting that Agricultural Support products have significantly higher marketing performance than Fresh Agricultural products. However, the difference between Fresh Agricultural and Processed Agricultural products was not significant (p-value 0.479), nor was the difference between Processed Agricultural and Agricultural Support products (p-value 0.065). Overall, these findings show that agricultural support products, such as fertilizers and farming tools, outperform fresh products in marketing performance, while there are no significant differences between fresh and processed products or between processed

Table 7. One-way ANOVA and group descriptives.

		F	df1	df2	p
Marketing Performance		4.79	2	17.1	0.022
Group Descriptives					
	Agricultural Product Categories	N	Mean	SD	SE
Marketing Performance	Fresh Agricultural	70	4.80	1.77	0.212
	Processed Agricultural	202	5.08	1.74	0.123
	Agricultural Support	7	6.29	1.11	0.421

Table 8. Games-Howell Post-Hoc Test - Marketing Performance.

		Fresh Agricultural	Processed Agricultural	Agricultural Support
Fresh Agricultural	Mean difference	—	-0.284	-1.490*
	t-value	—	-1.160	-3.150
	df	—	118.000	9.390
	p-value	—	0.479	0.027
Processed Agricultural	Mean difference	—	—	-1.200
	t-value	—	—	-2.740
	df	—	—	7.060
	p-value	—	—	0.065
Agricultural Support	Mean difference	—	—	—
	t-value	—	—	—
	df	—	—	—
	p-value	—	—	—

Note. * $p < .05$, ** $p < .01$, *** $p < .001$



and support products. This highlights the need for stronger marketing strategies to enhance the performance of fresh and processed products to compete with the agricultural support category.

DISCUSSION

The impact of digital marketing competencies on marketing performance and continuance intention: Digital Marketing Competencies have a positive impact on Marketing Performance, indicating that the higher the digital marketing competencies, the better the marketing performance achieved. These competencies also directly influence Continuance Intention, the intention to continue using digital marketing strategies in the long term. Zia and Alzahrani (2022) revealed that e-marketing factors are crucial in driving sustainable consumer behaviour in the agricultural sector. Ji *et al.* (2020) supported this by highlighting the importance of a supportive digital platform environment in building consumer trust in agricultural e-commerce. Mihailović *et al.* (2024) emphasized that well-executed digital marketing strategies expand market reach and enhance customer interaction, ultimately boosting marketing performance. Furthermore, Li *et al.* (2020) demonstrated that combining e-commerce capabilities with organizational adaptability results in better performance. Yoshida and Yagi (2023) added that applying sustainability strategies through digital marketing enhances business continuity in the agricultural sector. Zahoor *et al.* (2022) underlined the importance of digital competencies in achieving market success amidst increasingly dynamic global competition.

Digital Marketing Competencies also positively influence Continuance Intention, reflecting the willingness to continue using digital marketing strategies in the long term. These competencies foster trust and comfort in the digital ecosystem, encouraging users to sustain their use of digital marketing technologies. Zia and Alzahrani (2022) stressed that e-marketing factors can sustainably influence consumer behaviour in agriculture, aligning with Zariman *et al.* (2022) findings that a supportive platform environment combined with high consumer satisfaction can enhance the intention to continue using digital platforms. Bo and Yang (2022) highlighted that positive brand perception and consumer loyalty are essential to encourage repeat purchase intentions. Additionally, Yoshida and Yagi (2023) emphasized that sustained use of digital technologies is often linked to co-creating value between consumers and businesses.

Marketing Performance also positively impacts Continuance Intention. Strong marketing performance reflects the effectiveness of achieving marketing goals, such as improving customer satisfaction and strengthening consumer relationships. This performance, in turn, encourages businesses and consumers to continue using digital marketing strategies or platforms sustainably. This relationship

highlights that when marketing outcomes are perceived as satisfactory, there is a stronger motivation to sustain effective marketing strategies. Rasputina (2022) noticed that digitization in marketing enables small agricultural businesses to expand their markets and improve performance. This aligns with Reddy and Mehjabeen (2019) found that government support is crucial to sustaining the intentions of small farmers to use digital platforms. Giannakopoulos *et al.* (2024) explained that digital marketing analytics, such as big data and artificial intelligence, enhance decision-making, fostering the sustainability of marketing strategies. Rathore (2017) highlighted the importance of targeted marketing campaigns in driving sustainable decisions among stakeholders. Furthermore, Morepje *et al.* (2024) revealed that adopting e-commerce improves farmer participation in digital markets, directly influencing their intention to continue using these platforms (Su *et al.*, 2021).

The mediating role of marketing performance and moderating role of agricultural product categories: Marketing Performance serves as a mediator in the relationship between Digital Marketing Competencies and Continuance Intention. This suggests that digital marketing competencies not only directly influence sustainability intentions but also indirectly through enhanced marketing performance. The mediation findings indicate partial mediation in the relationship. Li *et al.* (2020) demonstrated that digital marketing competencies improve market performance by strengthening brand trust and consumer appeal. This underscores the importance of Marketing Performance as a bridge between Digital Marketing Competencies and Continuance Intention. (De Noronha *et al.*, 2023) emphasized that strong digital capabilities help businesses in emerging markets effectively navigate market complexities, leading to better performance and driving the intention to continue using digital marketing strategies. Yoshida and Yagi (2023) highlighted that sustainability intentions often depend on the direct impact of marketing success on consumer perceptions. Zahoor *et al.* (2022) further added that digital competencies generate better market outcomes, forming the foundation for sustained consumer engagement with these strategies. This study reinforces the notion that Marketing Performance is not only a result of Digital Marketing Competencies but also a key driver of sustainability intentions, ensuring the long-term effectiveness of digital marketing strategies.

Agricultural Product Categories act as a moderator in the relationship between Digital Marketing Competencies and Marketing Performance. The findings indicate quasi moderation in the relationship. This demonstrates that the effectiveness of digital marketing competencies in improving marketing performance varies based on the type of agricultural product being marketed, such as fresh, processed, or support products. Certain agricultural products benefit more from effective digital marketing strategies. For instance,



agricultural support products like fertilizers and farming tools tend to achieve higher marketing performance compared to fresh products due to their more segmented target audience and specific communication needs. On the other hand, marketing fresh products may require more creative digital approaches to emphasize their freshness and natural qualities. This moderating role underscores the importance of tailoring digital marketing strategies to the product category to maximize marketing performance.

Research by Mihailović *et al.* (2024) indicated that digital marketing strategies tailored to product types can significantly enhance customer interaction and market appeal. Zia and Alzahrani (2022) further emphasized that e-marketing approaches specific to consumer needs deliver more effective results, especially for agricultural products with distinct characteristics. Bo and Yang (2022) revealed that brand perception and consumers' willingness to pay a premium for agricultural products are highly dependent on marketing approaches aligned with product types. These findings align with Gregory *et al.* (2007) research, which highlights that digital strategies like e-commerce broadcasting are more effective for products with clear added value. This research underscores that agricultural product categories moderate the relationship between digital marketing competencies and marketing performance, suggesting that business operators need to understand their product characteristics to design appropriate and effective digital marketing strategies.

Differences in marketing performance based on agricultural product categories: Marketing Performance shows clear differences based on agricultural product categories, namely processed products, support products, and fresh products. Processed products such as rice, ground coffee, cassava chips, and palm sugar dominate respondents' choices, reflecting high attention to products with added value and longer shelf life (Zia and Alzahrani, 2022; Mihailović *et al.*, 2024). Support products, including organic fertilizers, plant seeds, and farming tools, while having fewer respondents, tend to show better marketing performance. This may be related to a more specific target market and urgent needs in this sector (Bo and Yang, 2022; Zhang, 2024). Fresh products such as spinach, carrots, mangoes, chilli peppers, and ginger occupy a middle position in respondent distribution. However, challenges like limited product shelf life and high market competition require more innovative marketing strategies to increase their appeal (Shankar *et al.*, 2011; Yoshida and Yagi, 2023). Each product category demands marketing approaches aligned with its characteristics to maximize marketing outcomes, highlighting the importance of adapting digital strategies to the specific needs of the agricultural market (Zia and Alzahrani, 2022; Mihailović *et al.*, 2024).

Conclusion: Digital Marketing Competencies have been proven to positively influence Marketing Performance and

Continuance Intention. This relationship is strengthened by the role of Marketing Performance as a mediator, which not only has a direct impact but also enhances continuance intention through improved marketing performance. However, the effectiveness of these digital marketing competencies is significantly influenced by the type of product being marketed, with Agricultural Product Categories serving as a moderating factor. Agricultural Support Products, such as fertilizers and farming tools, demonstrate the most dominant marketing performance compared to other product categories. This reflects the ability of support products to attract market attention more effectively. On the other hand, Fresh Agricultural Products face greater challenges in increasing their market appeal. Processed Agricultural Products fall in between the two categories, showing no significant differences in marketing performance when compared to either fresh or support products. These findings emphasize that marketing success heavily depends on the characteristics of each product category. To enhance competitiveness, more innovative and strategic marketing approaches are needed, especially for fresh and processed products, to better align with the dynamic needs and preferences of the market. Therefore, agricultural business operators must optimize their digital marketing competencies and tailor their strategies based on product types to achieve better and more sustainable marketing outcomes.

CRedit author statement: This research is a collaborative effort among five authors. Nofal Supriaddin was responsible for research design, hypothesis formulation, and theoretical framework development. Astil Harli Roslan led data collection and statistical analysis. La Ode Hamida, contributed to result interpretation and writing the discussion section. Suharjuddin handled manuscript editing and final review before publication. La Ode Almanan contributed to data validation and technical supervision throughout the research. All authors read and approved the final version of this manuscript.

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SDGs addressed: Decent Work and Economic Growth, Industry, Innovation, and Infrastructure, Responsible Consumption and Production.

Informed consent: N/A

Policy referred: The National Digital Transformation Policy, MSME Empowerment Programs, Agricultural Digitalization and Market Access Improvement.

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